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Abstract

On a substrate made of e.g., sapphire single crystal is formed an Al underlayer having a crystallinity of 90/seconds or below in FWHM of X-ray rocking curve. Then, on the AlN underlayer is formed a buffer layer having a composition of  $\text{Al}_p\text{Ga}_q\text{In}_{1-p-q}\text{N}$  ( $0 \leq p \leq 1$ ,  $0 \leq q \leq 1$ ), and on the buffer layer is formed a GaN-based semiconductor layer group.

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